Simple Rearrangement of Shorting-pins Eliminates Critical Center Pin Dependence. D.J. ERSKINE, Lawrence Livermore Nat. Lab.-- In shock EOS experiments using high velocity thin projectiles, a hexagonal arrangement‡ of 13 shorting pins (7-"down" including center, 6-"up") is conventionally used to measure the transit time of a curved and tilted shock front propagating through a sample. A weakness of this arrangement is the critical dependence on the center pin. Without the center pin the bowing cannot be determined. In turn, the transit time cannot be determined without the projectile bowing. Consequently, even in shots where the center pin is successful, the transit time uncertainty is largely determined by the uncertainty of the single center pin, rather than an average over the other 6. We discover that by simply swapping the position of 3 pin pairs we eliminate the critical dependence on the center pin and thereby practically reduce the transit time uncertainty. The 13 pin hexagonal close-packed arrangement is preserved, allowing use of some existing pin retaining hardware and cabling arrangements.

‡Mitchell, A.C. and W. J. Nellis, Rev. Sci. Instr. 52, 347 (1981).

*Work at LLNL was performed under auspices of U.S. DoE contract No. W-7405-ENG-48.

Dave Erskine
Lawrence Livermore National Lab
P.O. Box 808, L-299
Livermore, CA 94550